

WHAT IS CLAIMED IS:

1. An airbreathing fuel cell comprising end plates, a unit cell disposed between the two end plates, a fuel distribution manifold disposed centrally of the unit cell to supply a fuel to the unit cell, a single tie bolt extending centrally through the fuel distribution manifold and through the unit cell to unite these elements, fixing nuts screwed onto both ends of the tie bolt to integrally clamp the unit cell between the end plates with O-rings or the like therebetween, and a cell stack formed by stacking a plurality of those unit cells, which comprise a solid polymer electrolyte membrane, an oxygen passage plate and a fuel electrode, which are provided on both sides of the solid polymer electrolyte membrane to be opposed to each other, the oxygen passage plate provided adjacent and toward the oxygen electrode, and separator plates provided adjacent and outside the oxygen passage plate and the fuel electrode, and wherein the fuel distribution manifold is formed into a rod-shaped body having a polygonal-shaped cross section, a fuel supply passage is formed in the tie bolt, and a plurality of fuel distribution passages are provided to be communicated to the fuel supply passage and formed between central holes of the unit cells and an outer peripheral surface of the fuel distribution manifold.
2. The airbreathing fuel cell according to claim 1, wherein the fuel distribution manifold comprises

radial cut grooves formed on both axial ends thereof, and a fuel is supplied to the unit cells through the cut grooves and the fuel distribution passages from an end of the fuel distribution manifold.

3. The airbreathing fuel cell according to claim 1, wherein the fuel supply passage in the tie bolt extends from both ends of the tie bolt to positions on both ends of the cell stack along a central axis of the tie bolt and radially in the positions on both ends of the cell stack to be communicated to the fuel distribution passages.

4. The airbreathing fuel cell according to claim 2, wherein the fuel supply passage in the tie bolt extends from both ends of the tie bolt to positions on both ends of the cell stack along a central axis of the tie bolt and radially in the positions on both ends of the cell stack to be communicated to the fuel distribution passages.

5. The airbreathing fuel cell according to claim 1, wherein the fuel distribution passages have a substantially sector-shaped cross section and extend axially along the fuel distribution manifold.

6. The airbreathing fuel cell according to claim 2, wherein the fuel distribution passages have a substantially sector-shaped cross section and extend axially along the fuel distribution manifold.

7. The airbreathing fuel cell according to claim 3, wherein the fuel distribution passages have a

substantially sector-shaped cross section and extend axially along the fuel distribution manifold.

8.           The airbreathing fuel cell according to claim 4, wherein the fuel distribution passages have a substantially sector-shaped cross section and extend axially along the fuel distribution manifold.